The succinylation degree of the E-NH_2 group of atelocollagen can be controlled by controlling the amount of succinic anhydride, the pH and the time of reaction. The succinylation degree of the atelocollagen prepared by the method described above was over 85% and the isoelectric point of the atelocollagen was 4.5. The degree of succinylation can be determined by the TNBS (Trinitrogenen sulfuric acid) method (Kakade, M. L. and Liener, I. E. (1969) Anal. Biochem. 27, 273–280).

Atelocollagen which is succinylated to more than 10% of the total lysine residue (E-NH_2) is soluble at physiologic conditions (pH 7.0, isotonic condition). Therefore, for eye visco-surgery use, succinylation of more that 10% of the atelocollagen E-NH_2 groups is essential in order that the resulting solution be clear.

The denaturation temperature (TD) of succinylated atelocollagen is dependent on the succinylation degree. Since the TD drops with an increasing degree of succinylation, an upper limit on the desirable degree of succinylation is imposed. For example, the TD is 39.5° C. at 24% succinylation, 39.2° C. at 35% succinylation and 34.0° C. at 90% succinylation. A higher TD is of course, preferable for eye use. Therefore, while a 10% degree of succinylation of the E-NH_2 groups is necessary, a 20–50% succinylation degree is preferable.

EXAMPLE 2

Preparation of atelocollagen succinylated to varying degrees was accomplished as follows:

To 100 ml of 0.5% atelocollagen solution at pH 3.0 was added 0.1 N NaOH to adjust the pH to 9.0.

To this atelocollagen at pH 9.0, was added 0.1 ml of 1% succinic anhidride in acetone solution, and the pH of the reaction mixture was maintained at pH 9.0 by adding 0.1 N NaOH for 3 hours. Then the mixture was dialyzed against water to remove the succinic acid. The dialyzed succinylated atelocollagen was freeze-dried, and redissolved in physiologic saline, pH 7, at an atelocollagen concentration of 2%. The succinylation degree of this atelocollagen was 11.3%.

EXAMPLES 3 and 4

The above procedure was repeated using 0.3 ml and 1 ml of the 1% succinic anhidride acetone solution. The resulting atelocollagen samples had degrees of succinylation of 24% and 35% respectively.

We claim:

1. A solution of succinylated atelocollagen suitable for use in ophthalmic viscosurgery and vitreous replacement comprising atelocollagen succinylated to between about 10% to 50% of the total lysine residue and dissolved in a buffered solution to a concentration of between 0.5% and 5% by weight.

2. A solution for intraocular use, said solution comprising atelocollagen succinylated to between about 20% to 50% and dissolved in an aqueous buffer solution to a concentration of between about 0.5% and 5% by weight.

3. The solution of claim **1** wherein the atelocollagen is succinylated with succinic anhydride.

4. The solution of claim **3** wherein the aqueous buffer solution is phosphate buffered saline.

5. A solution of succinylated atelocollagen suitable for use in ophthalmic viscosurgery and vitreous replacement comprising atelocollagen succinylated to between about 10% to 50% of the total lysine residue and dissolved in a phosphate buffered saline solution of pH 7.0 to 7.4 to a concentration of between 0.5% and 5% by weight.

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